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Challenges for future of Natural Spaces of Canary Islands, Spain

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Abstract

The preservation of biodiversity is a fundamental objective of all policies related to a more sustainable development in any modern society. The rain forest and pine forests are two unique Canarian ecosystems with high importance to global biodiversity, holding a large number of endemic species and subspecies that is a priority to preserve. In this work the challenges that will face the natural areas of the Canary Islands are studied, as well as their fundamental value for economic and environmental development of the islands.

1. Introduction

The General Assembly of the United Nations adopted, on December 20, 2006, a resolution (A/RES/61/193) establishing 2011 as the International Year of Forests. The General Assembly has stressed the need for sustainable management of all types of forests, including fragile forest ecosystems, and believes that efforts should focus on raising awareness at all levels to strengthen the management, conservation and sustainable

exploitation of all types of forests for the benefit of present and future generations.

The Canary Islands, despite their relative small size and low specific weight in the world, is no stranger to global problems identified in the conservation of forests and the importance they have for economic, cultural and environmental benefits. Sustainable forest management is essential in this regard to ensure compatibility between the different benefits of the forest.

The specific role of forests and their management are still yet themes found on our islands, so the International Year of Forests has provided a unique opportunity to raise awareness of the forest world and closer to our society.

The main causes of the decrease in forest cover have been different types of human activities, from the first arrival of the aborigines and later in a very intense way when the first Europeans arrived. Since the second half of the twentieth century, different areas of high natural value gradually began to be protected through legislation and establishment of national parks and protected natural areas network; the trend towards concentration of urban centers and most human activities in the coastal areas damages some types of vegetation but release many others from the pressure due to their distribution in inland areas of the islands. Proper management in recent times of forests in different protected areas will accelerate the process of natural regeneration but is associated with a deep shade of broad public awareness and environmental awareness covered by a scientific research and would be compromised.

In 30 years it has been known temperament of the species and their different vulnerabilities, a fact that requires weighing the choice of species in afforestation according to the characteristics of the forest station. Plantations should be carried out in autumn with the first rains, although this does not always guarantee the roots, so has often proven the need for watering.

Canarian forests show a significant variety of strategies in their feedback. Thus we find species where asexual reproduction (daughter, wild Orangeman), combinations of asexual and sexual reproduction (faya, laurel), formation of seedling banks (laurel and pine), or permanent seed banks (heather, yew) predominates. These strategies make the pioneer species or mature character, and explain why some ecosystems recover more quickly after the abandonment of their exploitation.

When the criterion is the potential transformation to ecosystem, a mere observation of the dynamics and natural evolution of species such as elms, poplars and chestnut sufficient to reveal the beneficial role they are able to offer. The engine dynamics is the struggle for the light, beating species more tolerant of shade and whose feet reach higher. Fortunately species outnumber mature laurel chestnut, elm and poplar tolerance to both light and canopy heights. Hence it is desirable and relatively easy to drive the process towards indigenous formations simply enhancing forestry and natural succession dynamics.
The legal definition of "mount" overly broad and often includes a certain degree of expressions, but if we take as reference the Law 43/2003, of 21 November, of Forestry, it is the assumed in Document Advance Planning Guidelines Forest Resources, is that only developed land or cultivated are beyond such consideration. Thus, 95.3 % of the protected area in the Canary Islands is likely to be regarded as "mount" and therefore, as a forest landscape.

2. The Canarian forest as generator of resources

The mount is no longer a productive sector in the strict sense of the word, to become a protected area. Excluding hunting, the fundamental use of canaries to recreational forest is reduced, reversing scarce economic resources for the maintenance of the mountains; thus generating a cost management for forest administrations and therefore citizens.

The Canarian mount presents a number of difficult to quantify externalities on a financial budget. What is the value of having and bring out a unique landscape? What is the value of being able to hike in National

Parks? Are unquantifiable values but which generate economic resources and quality tourism, an example is the island of La Palma, away from tourism of sun and beach; we met some visitors whose purpose is to enjoy some spectacular scenery, hiking and environment agroforestry. All this has to be encompassed within a framework of sustainability and integrate tourism activities that can be performed in the bush with the criterion of preservation. Remember that the right to enjoy an environment suitable means for developing the person as well as the duty to preserve was enshrined in Article 45.1 of the Spanish Constitution.

A more objective character you have the direct exploitation of Mount Canary although residual materials are practically since the beginning of the use of forests is to conserve them. We must look back and list all the different uses that have been used by the inhabitants of the islands such as volatile oils or essential oil of pine, fruits, wood, charcoal, beekeeping, herbs, fish, pine needles, grasses, palm products and hunting were the only economic and livelihood resources.

Table 1. Forest Inventory of Canary Islands (MAAMA, 1972,1992,2002)

	Year 1972	Year 1992	Year 2002
Tenerife	83,185 has.	87,336 has.	112,451 has.
Las Palmas	-	17,578 has.	21,640 has.
Canarias	83,185 has.	104,914 has	134,091 has.

Obviously there are some environmental services that not only the inhabitants of the surrounding areas to exploit the mountains but also the inhabitants of large cities.

We cannot forget the use of the canary mountains as fixing of atmospheric CO2. Since the Kyoto Protocol (UNFCCC, 1997), is trying in every forum on climate market counterparties based carbon forestry change.

3. Canary woodland as hydrological regulator

From Aboriginal Garoé with tree (Fig 1.), perhaps the most important representation the relationship between forests and water in an insular system has been demonstrated the importance of forests with respect to surface and groundwater hydrology the islands.

The mountain in the Canary Islands and in particular its forest cover has a central role in the regulation of the water resources of the islands. This function can be divided into five factors (Santamarta & Naranjo, 2013).

- Regulation of water resources
- Conservation and fixing soils
- Damping effect of torrential rains
- Increased infiltration of both the island aquifer recharge
- Increased quality of water resources

The regulation of water resources is given by its participation in the insular hydrology, first plant cover is a damping of the kinetic energy that carry water droplets and the divisive effect thereof is decreased in the soil, Furthermore the effect of the use of horizontal precipitation, concentrating on the leaves of the branches drops little by little they are projecting on the tree and on the ground.

Fig. 1. *Arbol Garoé* in Hierro Island (Santamarta, 2013)

By effect of the roots, which may even drill basalt rock, infiltration process is improved and thus the effect of the island aquifers recharge. They also avoid soil compacting effect.

Roots also do a network effect and create a matrix where the soil is fully engaged preventing loss by the effect of rain and less wind.

Finally the hills are areas of recharge; therefore, in a way that no crops can salinize soil or introduce nitrate fertilizers or pesticides into the aquifer, neither infrastructure hat can waterproof the soil, or large population centers.

4. Canary Woodland as an energy resource

Biomass has always been associated with the development of the population in the Canary Islands as the first source of elemental energy that was in the archipelago and the main cause of deforestation of forests, which over the years has been replaced by fossil fuels.

Canaries forests store a lot of energy in the form of biomass, this may be important on a small scale for the design of small power plants with similar fuels from agricultural activities, these plants could supply to rural areas that could have energy self-sufficiency.

Furthermore, all the fuel year after year produces canary mount as branches, needles etc., if not removed can be a source of forest fires.

The problem with the Canary Islands for a boost in this achievement is to ensure the supply to the consumer centers or power plants for greater efficiency must operate continuously, allowing them to have a resource with regularity, quality and at an acceptable cost. In the Canary Islands also converge a unique topography with a very rugged terrain that makes the greater difficulty of use, significantly more expensive to it.

5. Conclusions

Today the major threats to Canarian forests are varied disturbances intrusion of invasive species, forest fires, human pressure, excessive urbanization, loss of soil and water erosion, lack of control in the management of herbivores. Exotic species become a symptom of environmental degradation, and never in a cause. We must learn to live with them and funds to eradicate those who truly pose an impact on fauna and flora. Allocate funds impetuously to control exotic causes only jeopardize the funding of actions that are needed later. The defense of the Canary mount against forest fires should be a shared role between the government and private owners, we resort to the well-known saying of prevention is better than cure and in

fact is much cheaper to have a fire season and to prevent having to spend means to extinction thereof. Forest fires are in flux, are going to be a purely emergency forest be an emergency civil protection and in this case, the priority is defined by the order: People - Real and animals - forest mass. This brings us to the emergency from the point of view of an Integrated Fire Management (Fire Urban Forest Fire +) where it is important to defend urban areas but not least is to address the wildfire and that eventually, will get back to affect more urban areas.

The relationship between forests and water resources are very evident especially in the Western Isles, in relation to recharge the aquifer through horizontal precipitation and an element that secures and preserves the ground. Losing means losing tree cover or part of water resources regulation, so we have to protect forests, creating protected areas for their effect in island aquifers. Protecting our forests protect our water quality and quantity.

The woodlands are no longer a productive sector, to become a protected space, primarily recreational, whose conservation is a cost to the government, this can have a negative somehow sense of consumption of economic resources when not, it's cheaper to keep them preserved forests without any action.

Society must understand that Canary fragile ecosystems are located and very threatened by various factors discussed further in an insular system with a very limited territory must consider the forest as an opportunity and an economic powerhouse. Forest certification in Spain began in 2002 with the PEFC system. A year later also awarded its first FSC certified sustainable management and made precisely in the Canaries. The area of forest certified companies have increased since then and demand for certified wood is growing both nationally and globally.

Future challenges with respect to our forests are to protect and continue to maintain its delicate balance, minimizing current and future threats. Can somehow increase the forest heritage and we therefore forest, economic and tourist relate facilities? Everything happens for informing the public of the importance of this vital resource and environmental level by investing in infrastructure financing and actions necessary for their protection and conservation.

Finally, it is noteworthy to mount as time perspective protective element of the islands against climate change, the importance of forest management on the status and future of the forests and on the preservation of these and benefits they provide to people, clearly evidenced in the international debate on climate change. As a clear example we can say that the forest in the Canaries - together with the sea - also generates a damping effect on climate change, both temperatures and rainfall.

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